

What is claimed is

1. A method for generating a quality oriented significance map for assessing the quality of an image or video,
5 comprising the following steps:

extracting features of the image or video;

determining a perceptual quality requirement of at least
10 one extracted feature; and

integrating the extracted features and the perceptual
quality requirement of the at least one extracted
feature to form an array of significance level values,
15 thereby generating the quality oriented significance
map.
2. The method according to claim 1, wherein the features of
the image or video are extracted using visual feature-
20 based information and knowledge-based information.
3. The method according to claim 2, wherein an absolute
motion and a relative motion are determined, and are
used to determine a quality level value of the pixel or
25 region of the image or video, wherein the determined
quality level value is a perceptual quality requirement
used for generating the quality oriented significance
map.
- 30 4. The method according to claim 2, wherein the extracted
features and the perceptual quality requirement of the
at least one extracted feature are integrated to form

the array of significance level values using a non-linear mapping function.

5. The method according to claim 4, wherein coupling effects as a result of the integration of the extracted features are used when forming the array of the significance level values.

6. The method according to claim 5, wherein the quality oriented significance map is obtained using the following equation:

$$m_{s,i,j,t} = \sum_n^N f_{s,i,j,t}^n - \sum_k c^{Lk} \cdot g_1(f_{s,i,j,t}^L, f_{s,i,j,t}^k)$$

wherein

$m_{s,i,j,t}$ is an element of the quality oriented significance map at scale s , position (i,j) and time t ;

$f_{s,i,j,t}^n$ is the n^{th} extracted feature,

c^{Lk} is a coupling factor which denotes the coupling

effects of combining $f_{s,i,j,t}^L$ and $f_{s,i,j,t}^k$;

n is the index extracted feature;

k is another index of extracted feature such that $1 < k < N$ and $k \neq L$;

N is the total number of extracted features; and

L is the maximum value of $f_{s,i,j,t}^n$ denoted as

$$L = \arg \max (f_{s,i,j,t}^n).$$

7. The method according to claim 6, wherein the nonlinear coupling mapping function is defined as:

$$g_1(x, y) = \min(x, y)$$

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8. The method according to claim 4, wherein the integration of the extracted features is performed by determining a weight to each of the extracted features, adding the weighted extracted features, and applying the nonlinear mapping function to the accumulated features, thereby forming the array of the visual significance level values.

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9. The method according to claim 8, wherein the quality oriented significance map is obtained using the following equation:

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$$m_{s,i,j,t} = g_2(w_1 f_{s,i,j,t}^1 + w_2 f_{s,i,j,t}^2 + \dots + w_n f_{s,i,j,t}^n)$$

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wherein

$m_{s,i,j,t}$ is an element of the quality oriented significance map at scale s , position (i, j) and time t ;

$f_{s,i,j,t}^n$ is the extracted feature;

n is the n^{th} extracted feature; and

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g_2 is the nonlinear mapping function.

10. The method according to claim 9, wherein the nonlinear mapping function is defined as:

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$$g_2(x) = \sqrt[n]{x+C}$$

wherein

α is a parameter for giving a nonlinear property, and
 C is a constant.

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11. The method according to claim 1, the generated quality oriented significance map is further processed in a post processing step to enhance the quality of the generated quality oriented significance map.

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12. The method according to claim 11, wherein the post processing step is performed using a Gaussian smoothing technique.

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13. A device for generating a quality oriented significance map for assessing the quality of an image or video, comprising:

an feature extraction unit for extracting features of
the image or video;

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a determination unit for determining a perceptual quality requirement of at least one extracted feature;
and

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an integration unit for integrating the extracted features and the perceptual quality requirement of the at least one extracted feature to form an array of significance level values, thereby generating the quality oriented significance map.

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14. A computer readable medium, having a program recorded thereon, wherein the program is to make the computer execute a procedure for generating a quality oriented significance map for assessing the quality of an image or video, comprising the following steps:

extracting features of the image or video;

determining a perceptual quality requirement of at least one extracted feature; and

integrating the extracted features and the perceptual quality requirement of the at least one extracted feature to form an array of significance level values, thereby generating the quality oriented significance map.

15. A computer program element which is to make the computer execute a procedure for generating a quality oriented significance map for assessing the quality of an image or video, comprising the following steps:

extracting features of the image or video;

determining a perceptual quality requirement of at least one extracted feature; and

integrating the extracted features and the perceptual quality requirement of the at least one extracted feature to form an array of significance level values, thereby generating the quality oriented significance map.